THE JURASSIC ECHINOID *CIDARITES MONILIFERUS* GOLDFUSS AND THE STATUS OF *EUCIDARIS*

by G. M. PHILIP

ABSTRACT. The type specimen of the Jurassic cidarid *Cidarites moniliferus* Goldfuss, recently designated as type species of the genus *Eucidaris* Pomel 1883, is redescribed. The species is considered to be a typical member of the genus *Stereocidaris* Pomel 1883. As these two genera were published simultaneously, it is recommended that *Eucidaris* should be abandoned in favour of *Stereocidaris*.

H. L. CLARK (1926, p. 3) writes of the genus *Eucidaris* that it 'is perhaps the best known and most universally accepted genus of Cidaridae. . . .' However, like many of the earlier echinoid genera, doubt exists as to the strict application of the name.

Eucidaris was originally proposed by Pomel (1883, p. 109) as a section of the genus *Cidaris*, with the following unsatisfactory diagnosis:

> *Eucidaris.* Tubercles à col lisse: trois espèces vivantes; presque toutes les espèces tertiaires; toutes les espèces crétacées, mois une (20); quelques jurassique seulement (*C. Morieri, Honorinæ, propinqua, marginata, monilifera, multipunctata*); la plupart des triasiques (7).

Döderlein (1887, p. 42), who was the next writer to use the name, employed *Eucidaris* for the living species group embracing *Cidarites metularia* Lamarck, *C. tribuloides* Lamarck, and *C. thouarsii* Valenciennes, and it is in this sense that the genus has come to be used.

The question was reviewed in a series of papers on the nomenclature of cidarid genera early this century (Bather 1908, 1908*a*, 1909; H. L. Clark 1908, 1909) where it was agreed that, as *Gymnocidaris* A. Agassiz 1863 (originally proposed for *C. metularia*) was a homonym of *Gymnocidaris* L. Agassiz 1838, the name *Eucidaris* Pomel should be applied to the *metularia* species group. H. L. Clark (1909) designated *C. metularia* as type species of *Eucidaris* Pomel. Bather (1909) agreed with this designation, observing that 'We may well suppose that the 'trois espèces vivantes' of Pomel's list were *Cidaris metularia, C. tribuloides* and *C. thouarsi*'.

And here the matter has rested for fifty years with the genus *Eucidaris* Pomel universally interpreted through *C. metularia*, a species not named in the founding of the genus, and so strictly not available for designation as type species. (Lambert and Thiéry 1910, have been the only subsequent authors who have retained *Cidaris* s.st. for the *metularia* species group, taking this view from the misinterpretation of a pre-Linnaean figure given by Rumphius, *fide* Mortensen 1910.) So well established was the generic name, particularly among neontologists, that there existed a clear case for action by the I.C.Z.N. to stabilize the genus in accordance with accustomed usage.

However, Cooke (1959, p. 8) recently noted that *C. metularia* was not among the names originally listed by Pomel, and so was not available for designation as type species of *Eucidaris*. He designated '*Cidarites monilifera* Goldfuss' as type species of the genus

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Eucidaris Pomel. Since the generic relationships of *Cidarites moniliferus* Goldfuss are not apparent from the available figures and descriptions, the type material of *Cidarites moniliferus* Goldfuss is here described, together with an assessment of the generic relationships of the species.

'*Cidarites*' *moniliferus* Goldfuss

Text-figs. 1*a–d*; Plate 115

Cidarites moniliferus Goldfuss 1826, *Petref. Germaniæ*, i, p. 118, pl. 39, figs. 6*a–b*.
Cidaris monilifera Goldfuss, Cotteau 1876, *Paléont. française, Terr. juras.* 10 (1), pp. 163–7, pls. 185–6 (*cum synon.*).
Plegiocidaris monilifera (Goldfuss), Lambert and Thiéry 1910, *Ess. nomen. rais. Échin.* ii, p. 132.

Material. The type specimen, the test originally figured by Goldfuss, is catalogued as No. 305a, in the Goldfuss Collection, Geologisch-paläontologisches Institut der Friedrich Wilhelms-Universität, Bonn. Goldfuss states that his species come from the Jurassic of Switzerland. The specimen is labelled in the collection as questionably from the Randen Malm. Two radioles (305b) from the same general locality are also in the Goldfuss Collection, identified as *Cidarites moniliferus*. As Goldfuss states that radioles of his species are unknown, these could not have been seen by him when the species was described.

Description of test. The test is rather small and depressed, with wide apical system and peristome.

The ambulacra (text-fig. 1*b*) are about one-fifth of the width of the interambulacra, and are distinctly sinuate. The poriferous tract, of width similar to the interporiferous tract, is markedly sunken. The small marginal tubercles form a regular vertical series for most of the length of the ambulacra, but adorally they tend to be slightly irregular. On each ambital plate one to three small internal tubercles are present, aligned in one or two irregular vertical series. The pores are non-conjugate, with the separating wall rising to a definite elevation. They are rounded and slightly oblique, particularly adapically. The transverse ridge above the pores is low and ill defined.

Four or five interambulacral plates (nine in each interambulacral zone) are present in each vertical column. The aureoles, mounted toward the centre of each column, are rudimentary on the uppermost plate of each column of five plates. On the other plates, the aureoles are relatively small and rounded, well separated and deeply incised. The smooth, perforate, primary tubercles rise well above the level of the test. The scrobicular tubercles are large and possess aureoles elongated tangentially to the scrobicules of the primary tubercles. Outside of the scrobicular ring the interambulacra are covered with small, closely spaced secondary tubercles. The plates above the ambitus are extremely

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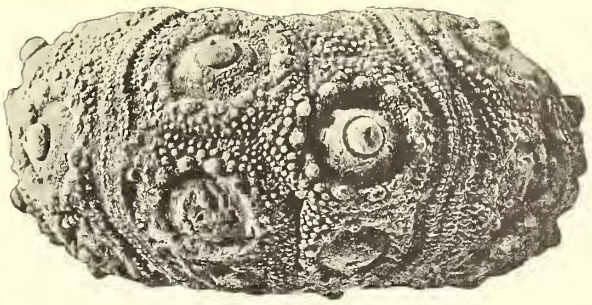
EXPLANATION OF PLATE 115

Figures unretouched, ×2.

Figs. 1–6. *Cidarites moniliferus* Goldfuss. 1, Lateral, 2, adapical, 3, adoral views of holotype (Goldf. Coll. No. 305a). 4–5, Radioles (Goldf. Coll. No. 305b). 6, Oblique adaptical view of holotype, showing sunken and bare interambulacral sutures.



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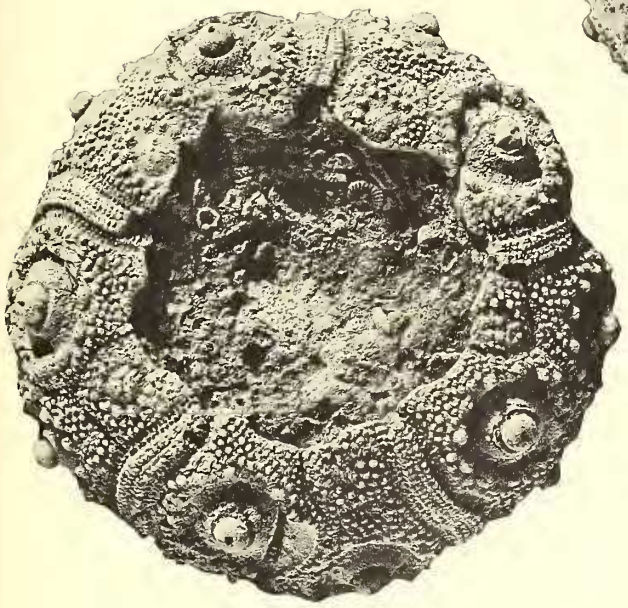

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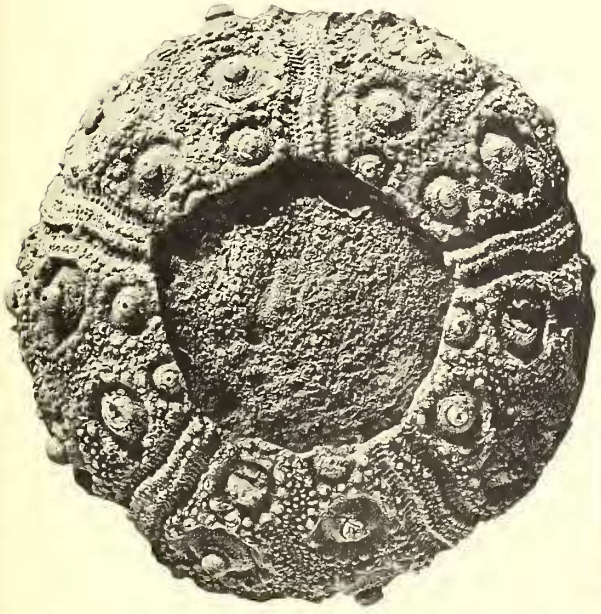

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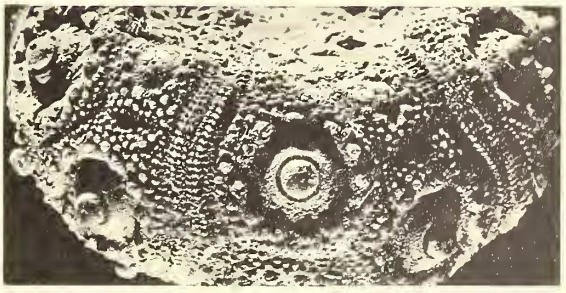

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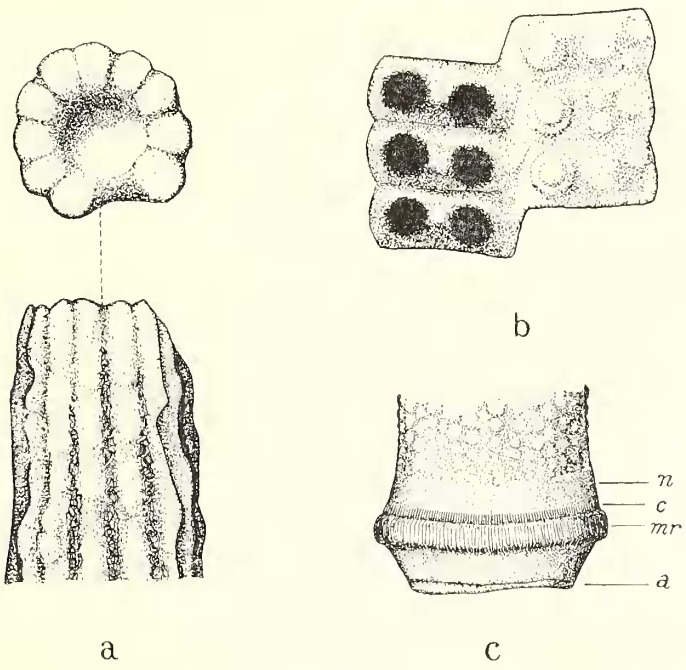
PHILIP, *Cidarites*

high. The sutures tend to be depressed and slightly incised, and the upper horizontal sutures may be bare, although pits are not developed at their admedian ends.

Measurements. H.d. 40 mm.; v.d. 19 mm.; diameter of apical system *c.* 20 mm.; diameter of peristome 17 mm. There are twenty-three ambulacral plates opposite the ambital interambulacral plates.

Radioles. The radioles are stout, cylindrical, and tapering, or slightly fusiform, with the shaft constricted above the neck. The base (text-fig. 1*c*) is short, and the milled ring



TEXT-FIG. 1. *Cidarites moniliferus* Goldfuss. *a*, Distal termination of radiole (Goldf. Coll. No. 305b, Pl. 115, fig. 4). Traces of the original coat of cortical hairs are shown schematically between the longitudinal ridges, ×6. *b*, Composite drawing of the ambital ambulacrum of the holotype test, ×25. *c*, Base of radiole (Goldf. Coll. No. 305b, Pl. 115, fig. 4). ×6. *n*=neck; *c*=collar; *mr*=milled ring; *a* = acetabulum.

is not markedly expanded. The collar is extremely short, about one-third of the length of the neck, which itself is relatively short and rather poorly defined distally. The shaft is ornamented by longitudinal series of rounded warts which coalesce distally to form well-marked ridges. Between these ridges are short spicules, which are interpreted as traces of the original cortical hairs, partly obscured by matrix they have collected. They seem to have been anastomosing rather than simple. Both the radioles are distally truncated, and one (text-fig. 1*a*) possesses a marked distal depression. The acetabula are not well preserved, but appear to be smooth in accordance with the character of the primary tubercles of the test.

Generic relationships. The rudimentary aureoles of the tubercles of the uppermost interambulacral plates immediately suggest a relationship with the genus *Stereocidaris*